Federal Democratic Republic of Ethiopia

EDICT OF GOVERNMENT

In order to promote public education and public safety, equal justice for all, a better informed citizenry, the rule of law, world trade and world peace, this legal document is hereby made available on a noncommercial basis, as it is the right of all humans to know and speak the laws that govern them.

ET ISO 6612 (1980) (English): Windows and door height windows -- Wind resistance tests

ISO INSIDE

BLANK PAGE

BRUTUM FULMEN
IGNORANTIA JURIS NON EXCUSAT
PROTECTED BY COPYRIGHT

ETHIOPIAN STANDARD

ES ISO 6612:2012

First edition

Identical with ISO 6612:1980

ICS: 91.060.50

Published by Ethiopian Standards Agency

©ESA

Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Building structures and elements of building (TC 41) and published by the Ethiopian Standards Agency (ESA).

The standard is identical with ISO 6612 Windows and door height windows - Wind resistance tests published by International organization for Standards (ISO).

For the purpose of this Ethiopian Standard , the adopted text shall be modified as follows.

- The phrase “International Standard” shall be read as “Ethiopian Standard”; and
- A full stop (.) shall substitute comma (,) as decimal marker.

ETHIOPIAN STANDARD ES ISO 6 :2012(E)

Windows and door height windows — Wind resistance tests

0 Introduction

Wind effects on windows are evidenced, among other reactions, by positive and negative pressures that may be conveniently simulated by the following tests.

These tests allow for the testing of the complete window to check that, under the influence of wind effects, the window :

- has an acceptable deformation;
- maintains its characteristics;
- does not endanger users.

1 Scope

This International Standard defines the method of testing to be used for assessing structural performance, under positive and/or negative static air pressure, of windows to be fitted in exterior walls and supplied in the form of completely assembled and finished units.

2 Field of application

This International Standard applies to all windows, including door height windows, made of any material, in their normal operating condition for which they are designed and installed according to the manufacturer's recommendations as in a finished building, bearing in mind the conditions of tests as defined below. This International Standard does not apply to the joints between the windows and surrounding components and materials.

3 Definitions

3.1 permanent residual deformation : Change in shape or dimension which does not disappear when pressures are no longer applied.

3.2 frontal displacement : Displacement of a point on a window measured normal to the plane of the window.

3.3 frontal deflection : Maximum difference between the frontal displacements taken along the same window.

3.4 relative frontal deflection : Value of the frontal deflection with respect to the distance between the two ends of the window under examination.

3.5 pressure differential : Difference between the absolute air pressure on the external surface of a window and the absolute air pressure on the internal surface of the same window.

The difference is positive when the external pressure is higher than the internal pressure. In the opposite case, it is negative. This pressure is expressed in Pascals[1].

---

[1] 1 Pa = 1 N/m^2

©ESA

4 Tests

4.1 Frontal deflection test up to a pressure differential of P_1 in both the positive and negative directions, which may be evaluated by the relative frontal deflection.

4.2 Repeated positive and negative application of pressure differentials up to P_2 for n cycles. This test may be evaluated by either operational characteristics or permanent residual deformation or both.

4.3 Safety test under positive and negative application of pressure differentials up to P_3 for one cycle. This test may be evaluated by either operational characteristics or permanent residual deformation or both.

The required values of P_1, P_2, P_3, n and the time exposure shall be defined by authorities having jurisdiction.

5 Apparatus

The basic test apparatus consists of the following :

a) Chamber with an opening to which the test window is fitted by its surround (see clause 7).

b) Means of providing a controlled differential air pressure across the window.

c) Device for rapid controlled changes of the differential air pressure operating between defined limits.

d) Means for measuring the difference in pressure between the two faces of the window.

e) Devices for measuring displacements.

f) Means for positioning the devices for measuring frontal displacements and of ensuring stability during the test.

6 Preparation of the window for testing

A surround for the specimen to be tested shall be prepared. This surround shall be stiff enough to withstand the test pressures without deflecting to an extent likely to impair jointing or to impose bending stresses on the test specimen. When the operating conditions are known, the fixing of the specimen shall simulate these (for example, a window in a curtain walling).

The window shall be fixed vertically, square, and without twists or bends.

The thickness, type of glass and the method of glazing shall comply with the requirements of the manufacturer. When there is no specification or when there is a possibility that the window will be used with different glasses, tests shall be carried out with a glass of minimum thickness with respect to the area.

The hardware fitted to the test window shall be supplied or specified by the manufacturer.

7 Preparation for the tests

The laboratory ambient air temperature and the test chamber air temperature shall be measured and recorded in the report.

Three air pressure pulses shall be applied; the rate of application shall be over a period of not less than 1 s, and the pressure shall be maintained for 3 s. These pulses shall be at the pressure required for the deformation test (P_1), but shall not be less than 500 Pa.

With the pressure reduced to zero, all operating parts of the window shall be opened and closed five times and finally secured in the closed position.

If it is desired to examine the resistance of the window under positive and negative pressure, each of the three tests (see clause 8) shall be carried out first under positive pressure then under negative pressure. A "preparation" as described in the second paragraph of this clause shall be carried out before the measurement of the deformation under negative pressure.

8 Tests

The window shall undergo the following sequence of tests as represented in figures 1 and 2.

8.1 Deformation test

Bring the device for measuring changes in position relative to the plane of the window into its measuring position. Subject the window to pressure, increasing in stages for a minimum period of 10 s at each stage, up to the maximum pressure required (P_1) for this test.

The pressures at these stages shall be 100, 200, 300, 400, 500 Pa and can then be increased in stages of 250 Pa maximum if the pressure required for the test is, exceptionally, higher than 500 Pa.

At each pressure differential, measure the frontal deflection at characteristic points given for the type of specimen to be tested.

If these points are located on the sash-frame or casing, the measurements shall be taken along the longitudinal axis of these window-frame elements. The reference plane for these measurements is a fixed plane which may be that of the window frame.

With the pressure reduced to zero, note the residual permanent frontal displacements at the characteristic points after stabilization.

8.2 Repeated pressure test

The window shall be subjected to n pressure impulses between 0 and P_2.

The period of transition from one pressure value to another shall not be less then 1 s. The pressure shall be held at their maximum or minimum values for at least 3 s at each impulse.

After completion of the test, open and close the moving parts of the window five times.

Note all damage or functioning defects detected after this test.

8.3 Safety test

The maximum required pressure P_3 shall be reached as quickly as possible, but not in less than 1 s, and held for 3 s.

Note any permanent residual deformations, damage or functioning defects detected after this test.

8.4 Diagrams

Two figures are included below showing diagrams of the sequence of the operation as examples for :

- a positive or negative pressure test only (figure 1);
- a test under positive and negative pressure (figure 2).

Include diagrams showing the sequence of operation in the report.

9 Recording of results

A sketch of the window shall show the points of measurement.

The results of the deformation test (see 8.1) shall be expressed graphically as a function of pressure for each measurement. Deformations are expressed in millimetres and pressures in pascals.

The residual permanent deformation shall be indicated.

Note damage and functioning defects resulting from the tests and show them on the window sketch.

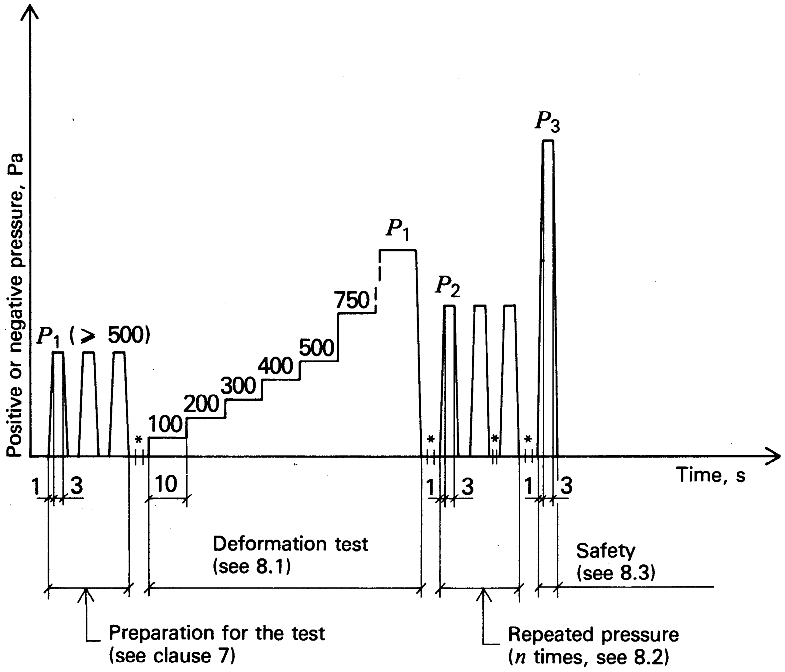

Figure 1 — Example of unidirectional pressure

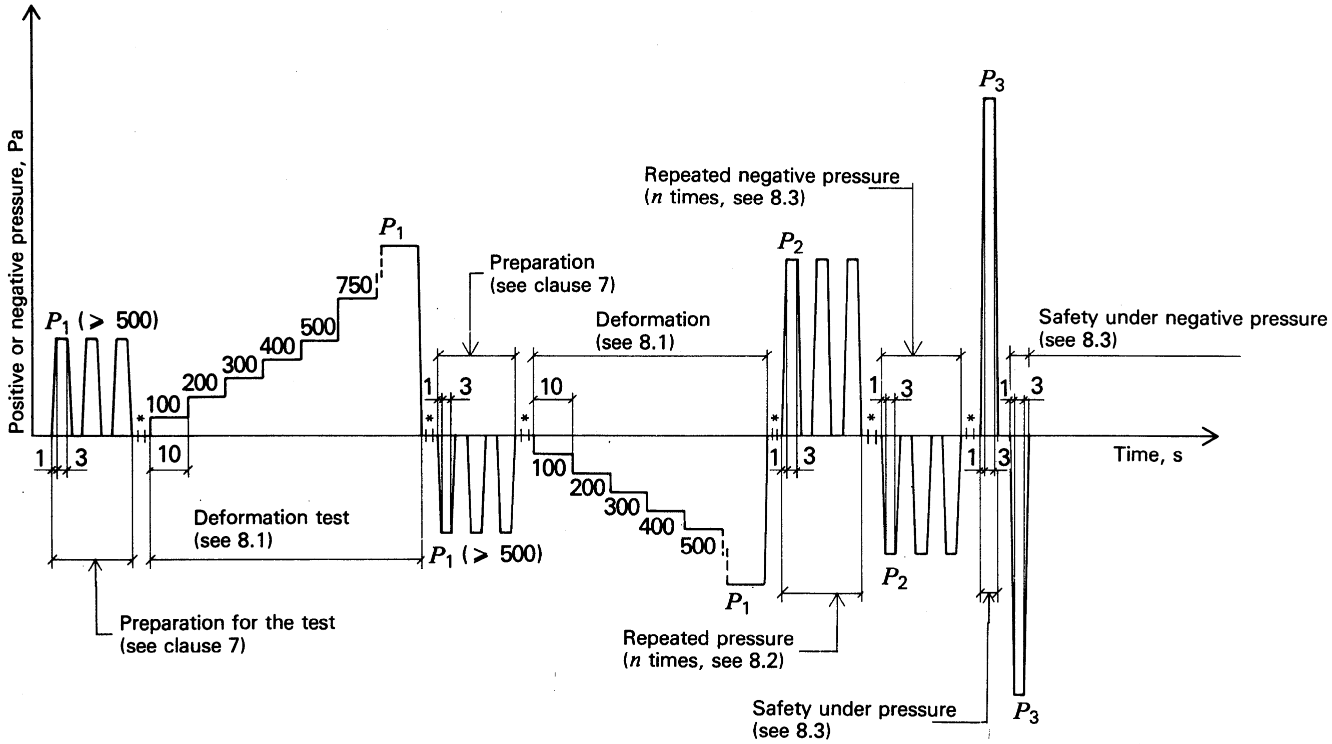

Figure 2 — Example of positive and negative pressure

* Indicates opening and closing

NOTE — The periods indicated are minimum times except for the safety test (P_3) for which the duration of 3 s is compulsory.

©ESA

የኢትዮጵያ የደረጃዎች ኤጀንሲ
Ethiopian Standards Agency

DRAFT

Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010.ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1970.

ESA's objectives are:-

- Develop Ethiopian standards and establish a system that enable to check weather goods and services are in compliance with the required standards,
- Facilitate the country's technology transfer through the use of standards,
- Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational Institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/ or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes.
Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

ESA has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of ESA.

International Involvement
ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM).It is a founding member of the African Regional Organization for standardization (ARSO).

More Information?
Contact us at the following address.
The Head Office of ESA is at Addis Ababa.

☎ 011- 646 06 85, 011- 646 05 65
📠 011-646 08 80
✉ 2310 Addis Ababa, Ethiopia
E-mail: info@ethiostandards.org,
Website: www.ethiostandards.org

Standard Mark